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SINGH, DALZID E	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/928,316	FREY ET AL.	
	Examiner	Art Unit	
	Dalzid Singh	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 6-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 6-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3 and 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koonen (US Patent No. 6,674,966) in view of Imajo e al (US Patent No. 6,807,374) and further in view of Ames et al (US Patent No. 5,371,814).

Regarding claim 1, Koonen discloses wireless network for linking data systems (14) and (74a), as shown in Fig. 7, comprising:

sensitive radio frequency (RF) equipment (in Fig. 7, Koonen shows sensitive radio frequency equipment, such as BTS, MUX/DEMUX and OPT TRX; it is well known that electronic components are sensitive to radio frequency or RF signals; for example, electronic components, such as capacitors, inductors, or transformers, found in optical transmitter (OPT TRX) of Koonen are sensitive to radio frequency);

an antenna assembly located apart from the RF equipment (in Fig. 7, Koonen shows antenna assembly (74a) located apart from the RF equipment); and

a single fiber, bi-directional fiber optic link coupling the antenna to the RF equipment, wherein both RF signals and data signals can be sent across the data link (in Fig. 7, Koonen shows a single bi-directional fiber optic link (16) coupling the antenna (74a) to the RF equipment (14); the fiber is bi-directional since it transmit signal in two

directions, shown by the arrows going into and out of WDM equipment (132); see also col. 9, lines 10-13, Koonen teaches transmission of signal in the upstream direction and downstream direction; signals coming from the antenna is considered as RF signal and signal coming toward the antenna is considered as data signals; wherein both RF and data signal are transmitted on the bi-directional fiber optic link (16)).

Koonen discloses the wireless network for linking data systems, as shown in Fig. 7, and differ from the claimed invention in that Koonen does not specifically disclose a shelter housing for the radio sensitive equipment. In wireless communication system, such as discussed above, the antenna is usually located outside on an open environment. Equipments or devices which transmit, receive and process signal coming to and going out of the antenna are usually located in the close proximity to the antenna. Environmental condition, such as excessive heat or damped condition, or electromagnetic radiation from the antenna, will add noise to data signal. Therefore, it would have been obvious to an artisan of ordinary skill in the art to provide a housing to shelter the radio frequency equipment which are sensitive to environmental conditions. One of ordinary skill would have been motivated to do this in order to reduce or eliminate noise caused by such environmental conditions.

Koonen discloses wireless network comprising antenna assembly as shown in Fig. 7, and differs from the claimed invention in that Koonen does not specifically show amplifier assembly coupled to a feed of an antenna of the antenna assembly and transmission and/or reception components. Imajo et al is cited to show amplifier assembly coupled to antenna assembly and transmission and/or reception components.

In Fig. 1, Imajo et al show amplifier assembly (72, 74) coupled to antenna assembly (73a, 73b) and transmission and/or reception components (71, 75). Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to provide amplifier assembly as taught by Imajo et al to the wireless system of Koonen. Since it is well known that signal degrades through transmission medium, therefore one of ordinary skill in the art would have been motivated to do such in order to boost signal level prior to transmission and after reception. It would have been obvious that the amplifier assembly and the transmission and/or reception components do not have the temperature sensitivity of the RF equipment in the shelter in order to withstand temperature variation.

Furthermore, as shown in Fig. 7, Koonen shows wavelength division multiplexing system and differ from the claimed invention in that Koonen et al do not disclose fiber optic rotary joints adapted to pass the fiber optic link through antenna gimbals. However, it is well known to couple fiber optic to the antenna using an interface such as fiber optic rotary joints. Ames et al is cited to show such well-known concept. In col. 2, lines 12-16, Ames et al teach the use of fiber optic rotary joints in the communication system. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to provide optical interface such as fiber optic rotary joints as taught by Ames to the system of Koonen. One of ordinary skill in the art would have been motivated to do such in order to provide low loss and low crosstalk between channels.

Regarding claim 2, as shown in Fig. 7, Koonen shows that the radio frequency equipment is located away from the antenna (74a), (equipments, such as BTS, MUX/DEMUX and OPT TRX are located away or off from the antenna). It is assumed that applicant means "away from" since it unclear what "off the antenna" means.

Regarding claim 3, in Fig. 7, Koonen shows WDM or wavelength division multiplexer for the transfer of the RF signals and data signals (signals coming from the antenna is considered as RF signal and signal coming toward the antenna is considered as data signals).

Regarding claim 6, as shown in Fig. 7, Koonen shows WDM (132, wavelength division multiplexer) located in the equipment (14) and coupling signals passing across the fiber optic link (16) to and from other RF sensitive equipment in the antenna (74a), (in col. 9, lines 19-23, Koonen teaches the use of directional coupler implemented in multiplexer and demultiplexer for coupling signals across the fiber optic link to and from RF sensitive equipment in the antenna, such as OPT TX (76a or 78a)).

Regarding claim 7, in Fig. 7, Koonen shows that the RF sensitive equipment in 14 includes special transmitters and receivers for different wavelengths of signals passing across the data link (as shown in Fig. 7, Koonen shows optical transceivers such as OPT TRX (116) or OPT TRX (118), comprises of transmitter and receiver for transmitting and receiving different wavelength across the data link (16), see col. 10, lines 9-20).

Regarding claim 8, Koonen discloses wireless network for linking data systems as discussed above, and differ from the claimed invention in that Koonen does not

specifically disclose that a shelter has an environment that is mild and dry. However, it is well known that operation of optical component such as laser diodes found in optical transmitter (OPT TRX) of Koonen is susceptible to variation in temperature. It is also well known that electronic components and the connection points are prone to rust and short circuit in a damped environment. Therefore, it would have been obvious to an artisan of ordinary skill in the art to place RF components of Koonen in a housing that is mild and dry and provide protection from environmental conditions. One of ordinary skill in the art would have been motivated to do this in order to prolonged operation lifespan of the equipment and maintained peak performance.

Regarding claim 9 (as far as understood), as shown in Fig. 7, Koonen shows that the antenna assembly (74a) comprises a radio frequency equipment assembly housing radio frequency equipment for the antenna (as shown in Fig. 7, the antenna assembly comprises radio frequency equipment, such as OPT TX (76a or 78a), which would obviously housed in a housing in order to protect the element from environmental conditions). It is assumed that applicant means "away from" since it unclear what "on from the antenna" means.

Regarding claim 10, in Fig. 7, Koonen shows that the antenna assembly (74a) includes wavelength division multiplexing (WDM) system.

3. Claims 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koonen (US Patent No. 6,674,966) in view of Imojo et al (US Patent No. 6,807,374) in

view of Ames et al (US Patent No. 5,371,814) and further in view of Cheong et al (US Patent No. 6,477,154).

Regarding claim 4, the combination of Koonen, Imojo et al and Ames et al discloses wireless network for linking data systems comprising fiber optic cable, as discussed above, and differ from the claimed invention in that the combination does not specifically disclose the system is adapted to send command link RF, return link RF, command and status signals over the fiber optical cable. However, in communication system it is well known to send command and status information signals. Cheong et al is cited to show such well known concept. In col. 7, lines 33-36, Cheong et al teach transmission or sending of control channel including a command signal. In col. 8, lines 10-12 and col. 10, lines 11-13, Cheong et al teach transmission of reverse link or return link and status information. As shown in Fig. 2 (215) and Fig. 6 (414), Cheong et al show that the link, which connects mBS and mBSC is a fiber optic link, since it carries optical signal such as Σ_1. The forward and reverse signal, which comprise of command and status signal is transmitted between mBS and mBSC over the fiber optic link. Therefore, it would have been obvious to an artisan of ordinary skill in the art to send command link RF, return link RF, command and status signals over the fiber optical cable as taught by Cheong et al to the system of Koonen. One of ordinary skill in the art would have been motivated to do this in order to provide centralized management of resources. Moreover, since the signal is transmitted to the antenna and from the antenna (as shown in Figs. 2 and 6), therefore the signal is RF or radio frequency signals (see col. 8, lines 28-32).

Regarding claim 11, the combination of Koonen, Imojo et al and Ames et al discloses wireless network for linking data systems comprising fiber optic cable, as discussed above, and differs from the claimed invention in that Koonen does not specifically disclose the system is adapted to send command link RF, return link RF, command and status signals over the fiber optical cable between the antenna assembly and the shelter. However, in communication system it is well known to send command and status information signals. Cheong et al is cited to show such well known concept. In col. 7, lines 33-36, Cheong et al teach transmission or sending of control channel including a command signal. In col. 8, lines 10-12 and col. 10, lines 11-13, Cheong et al teach transmission of reverse link or return link and status information. As shown in Fig. 2 (215) and Fig. 6 (414), Cheong et al show that the link, which connects mBS (i.e., antenna assembly) and mBSC (i.e., processor equipments for the antenna assembly which is obviously sheltered in order to protect from environmental conditions) is a fiber optic link, since it carries optical signal such as Σ_1. The forward and reverse signal, which comprise of command and status signal is transmitted between mBS and mBSC over the fiber optic link. Therefore, it would have been obvious to an artisan of ordinary skill in the art to send command link RF, return link RF, command and status signals over the fiber optical cable as taught by Cheong et al to the system of Koonen. One of ordinary skill in the art would have been motivated to do this in order to monitor operating condition of various devices. Moreover, since the signal is transmitted to the antenna and from the antenna (as shown in Figs. 2 and 6 of Cheong et al), therefore the signal is RF or radio frequency signals (see col. 8, lines 28-32 of Cheong et al).

4. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koonen (US Patent No. 6,674,966) in view of Imojo et al (US Patent No. 6,807,374) and further in view of Owens et al (US Patent Pubs. No. 2004/0264446).

Regarding claim 12, Koonen discloses wireless network for linking data systems (14) and (74a), as shown in Fig. 7, comprising:

sensitive radio frequency (RF) equipment (in Fig. 7, Koonen shows sensitive radio frequency equipment, such as BTS, MUX/DEMUX and OPT TRX; it is well known that electronic components are sensitive to radio frequency or RF signals; for example, electronic components, such as capacitors, inductors, or transformers, found in optical transmitter (OPT TRX) of Koonen are sensitive to radio frequency). ;

an antenna assembly located apart from the RF equipment (in Fig. 7, Koonen shows antenna assembly (74a) located apart from the RF equipment); and

a single fiber, bi-directional fiber optic link coupling the antenna to the RF equipment, wherein both RF signals and data signals can be sent across the data link (in Fig. 7, Koonen shows a single bi-directional fiber optic link (16) coupling the antenna (74a) to the RF equipment (14); the fiber is bi-directional since it transmit signal in two directions, shown by the arrows going into and out of WDM equipment (132); see also col. 9, lines 10-13, Koonen teaches transmission of signal in the upstream direction and downstream direction; signals coming from the antenna is considered as RF signal and signal coming toward the antenna is considered as data signals; wherein both RF and data signal are transmitted on the bi-directional fiber optic link (16)).

Koonen discloses the wireless network for linking data systems, as shown in Fig. 7, and differ from the claimed invention in that Koonen does not specifically disclose a shelter housing for the radio sensitive equipment. In wireless communication system, such as discussed above, the antenna is usually located outside on an open environment. Equipments or devices which transmit, receive and process signal coming to and going out of the antenna are usually located in the close proximity to the antenna. Environmental condition, such as excessive heat or damped condition, or electromagnetic radiation from the antenna, will add noise to data signal. Therefore, it would have been obvious to an artisan of ordinary skill in the art to provide a housing to shelter the radio frequency equipment which are sensitive to environmental conditions. One of ordinary skill would have been motivated to do this in order to reduce or eliminate noise caused by such environmental conditions.

Koonen discloses wireless network comprising antenna assembly as shown in Fig. 7, and differs from the claimed invention in that Koonen does not specifically show amplifier assembly coupled to a feed of an antenna of the antenna assembly and transmission and/or reception components. Imajo et al is cited to show amplifier assembly coupled to antenna assembly and transmission and/or reception components. In Fig. 1, Imajo et al show amplifier assembly (72, 74) coupled to antenna assembly (73a, 73b) and transmission and/or reception components (71, 75). Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to provide amplifier assembly as taught by Imajo et al to the wireless system of Koonen. Since it is well known that signal degrades through transmission medium,

therefore one of ordinary skill in the art would have been motivated to do such in order to boost signal level prior to transmission and after reception. It would have been obvious that the amplifier assembly and the transmission and/or reception components do not have the temperature sensitivity of the RF equipment in the shelter in order to withstand temperature variation.

Furthermore, the combination of Koonen and Imojo et al differs from the claimed invention in that the combination does not disclose the enclosure is for antenna motor control and power supplies and including configurable add drop multiplexer. However, it would have been obvious that the enclosure could be used to enclose antenna motor and power supplies. Moreover, it would have been obvious that the enclosure includes add/drop multiplexer. Owens et al is cited to show such well known concept. As shown in Fig. 1, Owens et al show enclosure (46) to enclose power supplies (see paragraph [0056]). As shown in Fig. 1, Owens et al show that the enclosure (46) is coupled to various customers through links (18) for adding and dropping services. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to provide enclosure for the power supplies, antenna motor and add/drop multiplexer as taught by Owens et al to the system of the combination. One of ordinary skill in the art would have been motivated to do such in order to reduce or eliminate noise caused by such environmental conditions. Furthermore, it would have been obvious to provide the antenna motor control at the enclosure (46) as taught by Owens et al in order to protect the circuitry from environmental conditions.

5. Claims 13, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koonen (US Patent No. 6,674,966) in view Ye et al (US Patent No. 6,782,199).

Regarding claim 13, Koonen discloses wireless network for linking data systems (14) and (74a), as shown in Fig. 7, comprising:

sensitive radio frequency (RF) equipment (in Fig. 7, Koonen shows sensitive radio frequency equipment, such as BTS, MUX/DEMUX and OPT TRX; it is well known that electronic components are sensitive to radio frequency or RF signals; for example, electronic components, such as capacitors, inductors, or transformers, found in optical transmitter (OPT TRX) of Koonen are sensitive to radio frequency);

an antenna assembly located apart from the RF equipment (in Fig. 7, Koonen shows antenna assembly (74a) located apart from the RF equipment); and

a single fiber, bi-directional fiber optic link coupling the antenna to the RF equipment (in Fig. 7, Koonen shows a single bi-directional fiber optic link (16) coupling the antenna (74a) to the RF equipment (14); the fiber is bi-directional since it transmit signal in two directions, shown by the arrows going into and out of WDM equipment (132); see also col. 9, lines 10-13, Koonen teaches transmission of signal in the upstream direction and downstream direction; signals coming from the antenna is considered as RF signal and signal coming toward the antenna is considered as data signals; wherein both RF and data signal are transmitted on the bi-directional fiber optic link (16)).

Koonen discloses the wireless network for linking data systems, as shown in Fig. 7, and differ from the claimed invention in that Koonen does not specifically disclose a

shelter housing for the radio sensitive equipment. In wireless communication system, such as discussed above, the antenna is usually located outside on an open environment. Equipments or devices which transmit, receive and process signal coming to and going out of the antenna are usually located in the close proximity to the antenna. Environmental condition, such as excessive heat or damped condition, or electromagnetic radiation from the antenna, will add noise to data signal. Therefore, it would have been obvious to an artisan of ordinary skill in the art to provide a housing to shelter the radio frequency equipment which are sensitive to environmental conditions. One of ordinary skill would have been motivated to do this in order to reduce or eliminate noise caused by such environmental conditions.

Furthermore, Koonen differs from the claimed invention in that Koonen does not disclose an enclosure coupled to the fiber optic link for antenna motor control and configurable add drop multiplexer. Ye et al is cited to show enclosure used to enclose control unit which and coupled to add/drop multiplexer. In Fig. 3, Ye et al show control unit (76) coupled to add/drop multiplexer (62). The control unit could be coupled to wireless device such as antenna. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to provide the enclosure for antenna controls and add/drop multiplexer as taught by Ye et al to the wireless system of Koonen. For example, the system of Ye et al could be placed between the antenna and the base station. One of ordinary skill in the art would have been motivated to do such in order to couple optical signals to other nodes.

Regarding claim 15, since the system of Koonen et al comprise of antenna and base station , therefore it would have been obvious to provide location operator controls, intermediate frequency equipment and power supplies and is located a distance from the antenna radio frequency assembly.

Regarding claim 16, as discussed above, the combination of Koonen and Ye et al disclose that the shelter and the antenna is serrated by fiber (see Fig. 7 of Koonen) and differ from the claimed invention in that the combination does not specifically disclose that the antenna and the shelter are separated by approximately 10 kilometers of single mode fiber. However, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to provide such distance between the shelter and the antenna. One of rodinary skill in the art would have been motivated to provide such in order to provide coverage to a particular location located at such distance as 10 kilometers.

6. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koonen (US Patent No. 6,674,966) in view of Ye et al (US Patent No. 6,782,199) and further in view of Ames et al (US Patent No. 5,371,814).

Regarding claim 14, the combination of Koonen and Ye et al disclose wavelength division multiplexing system (see Fig. 7 of Koonen) and differs from the claimed invention in that the combination does not disclose fiber optic rotary joints adapted to pass the fiber optic link through antenna gimbals. However, it is well known to couple fiber optic to the antenna using an interface such as fiber optic rotary joints. Ames et al

is cited to show such well known concept. In col. 2, lines 12-16, Ames et al teach the use of fiber optic rotary joints in the communication system. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to provide optical interface such as fiber optic rotary joints as taught by Ames to the system of the combination. One of ordinary skill in the art would have been motivated to do such in order to provide low loss and low crosstalk between channels.

7. Claims 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koonen (US Patent No. 6,674,966) in view of Imojo et al (US Patent No. 6,807,374) in view of Ames et al (US Patent No. 5,371,814) and further in view of Cheong et al (US Patent No. 6,477,154).

Regarding claim 17, Koonen discloses wireless network for linking data systems (14) and (74a), as shown in Fig. 7, comprising:

sensitive radio frequency (RF) equipment (in Fig. 7, Koonen shows sensitive radio frequency equipment, such as BTS, MUX/DEMUX and OPT TRX; it is well known that electronic components are sensitive to radio frequency or RF signals; for example, electronic components, such as capacitors, inductors, or transformers, found in optical transmitter (OPT TRX) of Koonen are sensitive to radio frequency);

an antenna assembly located apart from the RF equipment (in Fig. 7, Koonen shows antenna assembly (74a) located apart from the RF equipment); and

a single fiber, bi-directional fiber optic link coupling the antenna to the RF equipment, wherein both RF signals and data signals can be sent across the data link

(in Fig. 7, Koonen shows a single bi-directional fiber optic link (16) coupling the antenna (74a) to the RF equipment (14); the fiber is bi-directional since it transmit signal in two directions, shown by the arrows going into and out of WDM equipment (132); see also col. 9, lines 10-13, Koonen teaches transmission of signal in the upstream direction and downstream direction; signals coming from the antenna is considered as RF signal and signal coming toward the antenna is considered as data signals; wherein both RF and data signal are transmitted on the bi-directional fiber optic link (16)).

Koonen discloses the wireless network for linking data systems, as shown in Fig. 7, and differ from the claimed invention in that Koonen does not specifically disclose a shelter housing for the radio sensitive equipment. In wireless communication system, such as discussed above, the antenna is usually located outside on an open environment. Equipments or devices which transmit, receive and process signal coming to and going out of the antenna are usually located in the close proximity to the antenna. Environmental condition, such as excessive heat or damped condition, or electromagnetic radiation from the antenna, will add noise to data signal. Therefore, it would have been obvious to an artisan of ordinary skill in the art to provide a housing to shelter the radio frequency equipment which are sensitive to environmental conditions. One of ordinary skill would have been motivated to do this in order to reduce or eliminate noise caused by such environmental conditions. It is well known that RF equipments are sensitive to temperature.

Koonen discloses wireless network comprising antenna assembly as shown in Fig. 7, and differs from the claimed invention in that Koonen does not specifically show

amplifier assembly coupled to a feed of an antenna of the antenna assembly and transmission and/or reception components. Imajo et al is cited to show amplifier assembly coupled to antenna assembly and transmission and/or reception components. In Fig. 1, Imajo et al show amplifier assembly (72, 74) coupled to antenna assembly (73a, 73b) and transmission and/or reception components (71, 75). Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to provide amplifier assembly as taught by Imajo et al to the wireless system of Koonen. Since it is well known that signal degrades through transmission medium, therefore one of ordinary skill in the art would have been motivated to do such in order to boost signal level prior to transmission and after reception. It would have been obvious that the amplifier assembly and the transmission and/or reception components do not have the temperature sensitivity of the RF equipment in the shelter in order to withstand temperature variation.

Furthermore, the combination of Koonen and Imojo et al shows wavelength division multiplexing system (see Fig. 7) and differ from the claimed invention in that Koonen et al do not disclose fiber optic rotary joints adapted to pass the fiber optic link through antenna gimbals. However, it is well known to couple fiber optic to the antenna using an interface such as fiber optic rotary joints. Ames et al is cited to show such well known concept. In col. 2, lines 12-16, Ames et al teach the use of fiber optic rotary joints in the communication system. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to provide optical interface such as fiber optic rotary joints as taught by Ames to the system of the

combination. One of ordinary skill in the art would have been motivated to do such in order to provide low loss and low crosstalk between channels.

Furthermore, the combination of Koonen, Imojo et al and Ames et al discloses wireless network for linking data systems comprising fiber optic cable, as discussed above, and differ from the claimed invention in that the combination does not specifically disclose the system is adapted to send command link RF, return link RF, command and status signals over the fiber optical cable. However, in communication system it is well known to send command and status information signals. Cheong et al is cited to show such well known concept. In col. 7, lines 33-36, Cheong et al teach transmission or sending of control channel including a command signal. In col. 8, lines 10-12 and col. 10, lines 11-13, Cheong et al teach transmission of reverse link or return link and status information. As shown in Fig. 2 (215) and Fig. 6 (414), Cheong et al show that the link, which connects mBS and mBSC is a fiber optic link, since it carries optical signal such as Σ_1. The forward and reverse signal, which comprise of command and status signal is transmitted between mBS and mBSC over the fiber optic link. Therefore, it would have been obvious to an artisan of ordinary skill in the art to send command link RF, return link RF, command and status signals over the fiber optical cable as taught by Cheong et al to the system of Koonen. One of ordinary skill in the art would have been motivated to do this in order to provide centralized management of resources. Moreover, since the signal is transmitted to the antenna and from the antenna (as shown in Figs. 2 and 6), therefore the signal is RF or radio frequency signals (see col. 8, lines 28-32).

Regarding claim 20, as discussed above, the combination is adapted to carry both radio frequency signals and data signals across the data link.

8. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koonen (US Patent No. 6,674,966) in view of Imojo et al (US Patent No. 6,807,374) in view of Ames et al (US Patent No. 5,371,814) in view of Cheong et al (US Patent No. 6,477,154) and further in view of Ballance (US Patent No. 4,977,593).

Regarding claim 18, the combination of Koonen, Imojo et al, Ames et al and Cheong et al disclose transmitting of separate wavelength for upstream and downstream (see col. 9, lines 10-18) and differs from the claimed invention in that the combination does not specifically disclose that wavelengths or first channel is adapted to operate at a wavelength of 1310 nanometers and the second channel is adapted to operate at a wavelength of 1550 nanometers. However, in bidirectional optical communication is well known to provide such wavelengths first and second channel. Ballance is cited to show such well known concept. In col. 10, lines 56-68, Ballance discloses bidirectional system using 1550 and 1310 nanometers. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to provide such wavelengths in the system of the combination. One of ordinary skill in the art would have been motivated to do such in order to reduce crosstalk between channels.

Regarding claim 19, the combination of Koonen, Imojo et al, Ames et al and Cheong et al disclose transmitting of separate wavelength for upstream and

downstream (see col. 9, lines 10-18) and differs from the claimed invention in that the combination does not specifically disclose that wavelengths or first channel is adapted to operate at a wavelength of 1310 nanometers and the second channel is adapted to operate at a wavelength of 1550 nanometers. However, in bidirectional optical communication is well known to provide such wavelengths first and second channel. Ballance is cited to show such well known concept. In col. 10, lines 56-68, Ballance discloses bidirectional system using 1550 and 1310 nanometers. Therefore, it would have been obvious to an artisan of ordinary skill in the art at the time the invention was made to provide such wavelengths in the system of the combination. Furthermore, it would have been obvious that there exist transmitter operating at 1550 nanometers, a receiver operating at 1310 nanometers and a combiner splitter for 1310/1550 nanometers, and wherein the antenna includes a receiver operating at 1550 nanometers, a transmitter operating at 1310 nanometers and a combiner splitter for 1310/1550 nanometers (see Fig. 2 of Ballance and Fig. 7 of Koonen). One of ordinary skill in the art would have been motivated to do such in order to reduce crosstalk.

Response to Arguments

9. Applicant's arguments with respect to claims 1-4 and 6-11 have been considered but are moot in view of the new ground(s) of rejection.

10. Applicant's arguments filed 22 February 2006 have been fully considered but they are not persuasive.

On page 11 of the remarks, applicant argues that it is not clear whether the RF in terms of the microwave carrier frequency, or in terms of modulation placed on the microwave carrier, is communicated via the optical channel in Koonen. As shown in Fig. 7, Koonen shows fiber (16) as the communication medium, therefore, the signal is communicated via optical channel.

On page 12, applicant argues that the specification specifically lists up-converters and down-converters as having a temperature sensitivity that would necessitate environmental protection. As shown in Fig. 7, Koonen shows communication components having a temperature sensitivity that would necessitate environmental protection (components located at the station (14) are considered as temperature sensitive equipments).

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., up-converters and down converters) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Masoian et al (US Pub. No. 2002/0181668) is cited to show method and system for radio frequency/fiber optic antenna interface.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalzid Singh whose telephone number is (571) 272-3029. The examiner can normally be reached on Mon-Fri 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DS
April 14, 2006
Dalzid Singh